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EXAMINER	
AHMED, SALMAN	

ART UNIT	PAPER NUMBER
2616	

NOTIFICATION DATE	DELIVERY MODE
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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Office Action Summary	Application No.	Applicant(s)
	10/015,926	KRISHNAMURTHI ET AL.
	Examiner	Art Unit
	Salman Ahmed	2616

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *3/15/2007*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-68* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-68* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *12/10/2001* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Claims 1-68 are pending.

Claims 1-68 are rejected.

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

3. Claims 1, 2 and 30 are rejected under 35 U.S.C. 103(a) as being unpatentable over Numminen et al. (US PAT 6687499), hereinafter referred to as Numminen in view of Dejaco et al. (US PAT 5784406, hereinafter Dejaco).

In regards to claim 1 Numminen teaches receiving a first message having included therein test settings for one or more channels (column 7 lines 18-20, test mode means that the mobile station to be tested is instructed to maintain a connection on a certain transmission channel) comprising traffic channels, auxiliary channels, (column 11 lines 4-6, data, traffic and control channels) or a combination thereof (column 7 lines 46-47, at first the test equipment sends a comparison and statistical operation start command associated with the data channel); configuring the one or more channels based on the test settings in the first message (column 7 lines 59-61, The mobile station closes, i.e. activates, the test loop); receiving test packets via a forward traffic channel (column 8 lines 4-7, once the G loop has been activated the test equipment can start sending test data); transmitting loop back packets via a reverse traffic channel (column 8 lines 39-40, the test equipment receives the uplink frames sent by the mobile station), and transmitting signaling data via traffic or one or more auxiliary channels (column 11 lines 4-6, applicability of the invention to all mobile communication systems in which a mobile station can operate on data, traffic and control channels). Numminen teaches different modes (column 9 lines 14-15, G Loop and H Loop) of testing are supported, and the testing varies for each one or more channel; and receiving test packets via a forward traffic channel based on the supported mode of testing (column 8 lines 4-6, Once the G loop has been activated the test equipment can start sending test data, i.e. periods of a pseudorandom bit sequence packed in downlink frames).

Numminen does not explicitly teach the loop back packets comprise data for determining a packet error rate.

Dejaco in the same field of endeavor teaches that the next test conducted by the present invention measures the frame error rate of the communication link. In the exemplary embodiment, when a frame erasure occurs, vocoder 14 re-transmits the last previous good frame. In the exemplary embodiment, signal generator 28 provides 10 ms. tones that are centered within the 20 ms. frames transmitted by the communication system. These tones are sent in a predetermined pattern and then that pattern is analyzed at monitor 26 to determine whether it is the same pattern as was sent by signal generator 28. The number of mismatches in the pattern equals the number of frame erasures on the combined forward and reverse links. In the present invention, when system characterization tests are being conducted, the signal received by transceiver 5 is provided to loop back element 15, and provided directly back to transceiver 5, which re-encodes, modulates and upconverts the signal and provides the signal to antenna 6 for broadcast (column 6 lines 3-6 and column 8 lines 33-45).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify Numminen's system/method by incorporating the teachings of the loop back packets being comprised of data for determining a packet error rate as suggested by Dejaco. The motivation is that (as suggested by column 2 lines 40-67) during system deployment, the quality of signal transmission at various distances from a base station may be determined on the basis of qualitative characterization of the received signal by subscriber unit users and various system parameters (e.g., transmitted power level) may then be adjusted in order to improve communication quality; however, quantitative measurements of system performance

would allow for accumulation of performance data more accurate than the subjective characterizations of received signal quality solicited from actual subscriber users.

In regards to claim 30 Numminen teaches a method for testing one or more channels in a wireless data communication system, comprising: sending a first data transmission (column 8 lines 4-7, test data) via a first channel (column 5 lines 62-63, tests especially the operation of data channels) wherein the first data transmission comprises test packets (column 8 lines 4-7, once the G loop has been activated the test equipment can start sending test data); receiving a second data transmission via a second channel (column 8 lines 39-40, the test equipment receives the uplink frames sent by the mobile station), wherein the second data transmission includes parameter values descriptive of the first data transmission (column 8 lines 30-80, the bit error ratio or frame erasure ratio) and further comprises a record (column 8 lines 30-80, compiles statistics of the measurement results) for each test packet correctly received; and updating a plurality of variables (column 8 lines 30-80, signal level at which the downlink frames are delivered to the mobile station can be varied) based on the parameter values included in the second data transmission (column 8 lines 30-80, While the G loop is active the mobile station compares the received bit sequence portions to the locally produced portions and measures e.g. the bit error ratio or frame erasure ratio and compiles statistics of the measurement results in a desired manner. Since the received signal is examined in the G loop prior to channel decoding, the locally produced bit sequence at the mobile station also has to be channel encoded for the comparison to be meaningful. Complete statistics or information elements

representing the reception error status in general are sent uplink to the test equipment. The test equipment receives the uplink frames sent by the mobile station and demodulates and decrypts them so that the statistical results in the received frame can be processed by the test equipment. The signal level at which the downlink frames are delivered to the mobile station can be varied so that the bit error ratio (BER) detected by it represents the sensitivity of the receiver of the mobile station especially at low signal levels. It is typical of type approval tests that a certain minimum sensitivity is required of the mobile station, which means that at a given signal level the bit error ratio must not exceed a predetermined limit value).

Numminen does not explicitly teach determining a packet error rate based on information included in the second data transmission.

Dejaco in the same field of endeavor teaches that the next test conducted by the present invention measures the frame error rate of the communication link. In the exemplary embodiment, when a frame erasure occurs, vocoder 14 re-transmits the last previous good frame. In the exemplary embodiment, signal generator 28 provides 10 ms. tones that are centered within the 20 ms. frames transmitted by the communication system. These tones are sent in a predetermined pattern and then that pattern is analyzed at monitor 26 to determine whether it is the same pattern as was sent by signal generator 28. The number of mismatches in the pattern equals the number of frame erasures on the combined forward and reverse links. In the present invention, when system characterization tests are being conducted, the signal received by transceiver 5 is provided to loop back element 15, and provided directly back to

transceiver 5, which re-encodes, modulates and upconverts the signal and provides the signal to antenna 6 for broadcast (column 6 lines 3-6 and column 8 lines 33-45).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify Numminen's system/method by incorporating the steps of determining a packet error rate based on information included in the second data transmission as suggested by Dejaco. The motivation is that (as suggested by column 2 lines 40-67) during system deployment, the quality of signal transmission at various distances from a base station may be determined on the basis of qualitative characterization of the received signal by subscriber unit users and various system parameters (e.g., transmitted power level) may then be adjusted in order to improve communication quality; however, quantitative measurements of system performance would allow for accumulation of performance data more accurate than the subjective characterizations of received signal quality solicited from actual subscriber users.

In regards to claim 2 Numminen teaches each loop back packet includes data descriptive of one or more test packets (column 8 lines 30-80, While the G loop is active the mobile station compares the received bit sequence portions to the locally produced portions and measures e.g. the bit error ratio or frame erasure ratio and compiles statistics of the measurement results in a desired manner. Since the received signal is examined in the G loop prior to channel decoding, the locally produced bit sequence at the mobile station also has to be channel encoded for the comparison to be meaningful. Complete statistics or information elements representing the reception error status in general are sent uplink to the test equipment).

4. Claims 32-38 are rejected under 35 U.S.C. 103(a) as being unpatentable over Numminen in view of Gan et al. (US PAT 7027418, hereinafter Gan) and Vimpari et al. (US PAT 6169883, hereinafter Vimpari).

In regards to claims 32 and 33 Numminen teaches a method for testing the forward link for specific configuration of one or more auxiliary channels (column 11 lines 4-6, data, traffic and control channels) in wireless data communication system, comprising: receiving a first message having included therein test settings corresponding to auxiliary channels (column 6 lines 54-56, column 6 lines 66-67 and column 7 lines 1-8, the test equipment sends an immediate assignment 503 which may include various instructions for the mobile station. Particularly the immediate assignment 503 contains so-called test octets in which the first two bits indicate the contents of the test of the rest octet. By the priority date of this patent application values 11 and 10 of the values of the first two bits of the rest octet have been reserved but values 01 and 00 are unused. In accordance with a preferred embodiment of the invention at least one of these values can be reserved to indicate that in response to the immediate assignment 503 the mobile station to be tested has to set itself in a special test mode); configuring each auxiliary channel based on test settings applicable to the auxiliary channel (column 9 lines 14-15, G Loop and H Loop), wherein the test setting for each channel varies (column 9 lines 14-15, G Loop and H Loop); and transmitting each configured auxiliary channel in accordance with the applicable test settings (column 8 lines 4-6, Once the G loop has been activated the test equipment

can start sending test data, i.e. periods of a pseudorandom bit sequence packed in downlink frames).

Numminen does not explicitly teach test settings corresponding to a plurality of channels.

Gan in the same field of endeavor teaches message corresponding to test settings for a plurality of channels for testing (Table 1 and columns 14-15 lines 46-40).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify Numminen's system/method by incorporating the steps of test settings corresponding to a plurality of channels as suggested by Gan. The motivation is that (as suggested by Gan, column 4 lines 30-34) by testing plurality of channels, a system can skip a "bad" channel that suffers from interference, such as by moving onto the next channel in the sequence or by jumping to another randomly selected channel; thus making the system reliable.

Numminen and Gan does not explicitly teach a plurality of test settings in the message.

Vimpari in the same field of endeavor teaches by FIG. 8 showing a block diagram of the steps taken by the terminal after it has received a measurement message. The functions start after the terminal has received a message by radio containing a prompt to perform a measurement and information about which measurement functions it must perform. The terminal then seeks a specification of measurement functions from a table stored in the memory, FIG. 5. Each specification is a certain instruction set which is carried out under processor control. The measurements may be loop measurements

and measurements relating to the terminal adaptor and/or to the operation of the radio unit (column 10 lines 17-26).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify Numminen and Gan's system/method by incorporating the steps of receiving message corresponding to plurality of test settings as suggested by Vimpari. The motivation is that (as suggested by Vimpari, column 4 lines 20-45) by doing multiple tests by triggering them remotely saves time and resources benefiting both service providers and users economically.

In regards to claim 34 Numminen teaches one or more auxiliary channels is used for signaling (column 11 lines 4-6, data, traffic and control channels and column 6 lines 54-56, the test equipment sends an immediate assignment 503 which may include various instructions for the mobile station).

In regards to claims 35-37 Numminen teaches the first message includes a first test setting for a particular bit value to be transmitted on an acknowledgment (ACK) channel (column 6 lines 54-56, column 6 lines 66-67 and column 7 lines 1-8, the test equipment sends an immediate assignment 503 which may include various instructions for the mobile station. Particularly the immediate assignment 503 contains so-called rest octets in which the first two bits indicate the contents of the rest of the rest octet. By the priority date of this patent application values 11 and 10 of the values of the first two bits of the rest octet have been reserved but values 01 and 00 are unused. In accordance with a preferred embodiment of the invention at least one of these values can be reserved to indicate that in response to the immediate assignment 503 the

mobile station to be tested has to set itself in a special test mode) or the first message includes a second test setting (column 6 lines 54-56, column 6 lines 66-67 and column 7 lines 1-8, the test equipment sends an immediate assignment 503 which may include various instructions for the mobile station. Particularly the immediate assignment 503 contains so-called rest octets in which the first two bits indicate the contents of the rest of the rest octet. By the priority date of this patent application values 11 and 10 of the values of the first two bits of the rest octet have been reserved but values 01 and 00 are unused. In accordance with a preferred embodiment of the invention at least one of these values can be reserved to indicate that in response to the immediate assignment 503 the mobile station to be tested has to set itself in a special test mode) for a particular value to be transmitted on a data rate control (DRC) channel or the first message includes a third test setting (column 6 lines 54-56, column 6 lines 66-67 and column 7 lines 1-8, the test equipment sends an immediate assignment 503 which may include various instructions for the mobile station. Particularly the immediate assignment 503 contains so-called rest octets in which the first two bits indicate the contents of the rest of the rest octet. By the priority date of this patent application values 11 and 10 of the values of the first two bits of the rest octet have been reserved but values 01 and 00 are unused. In accordance with a preferred embodiment of the invention at least one of these values can be reserved to indicate that in response to the immediate assignment 503 the mobile station to be tested has to set itself in a special test mode) for a particular cover to be used for a data rate control (DRC) channel (column 6 lines 20-61).

In regards to claim 38 Numminen teaches the first message includes a fourth test setting indicative of maintenance of a test mode in event of a connection closure or a lost connection (column 7 lines 18-20, So test mode means that the mobile station to be tested is instructed to maintain a connection on a certain transmission channel. The mobile station is kept in the test mode by Layer 3 signaling).

5. Claims 59 and 60 are rejected under 35 U.S.C. 103(a) as being unpatentable over Numminen in view of Schmutz et al. (US PAT PUB 2002/0028675, hereinafter Schmutz) and Dejaco.

In regards to claim 59 Numminen teaches sending a first message having included therein test settings for the traffic channel (column 6 lines 54-56, the test equipment sends an immediate assignment 503 which may include various instructions for the mobile station); receiving a plurality of test packets at a plurality of rates (column 9 lines 14-15, G Loop and H Loop) on the traffic channel (column 8 lines 4-6, Once the G loop has been activated the test equipment can start sending test data, i.e. periods of a pseudorandom bit sequence packed in downlink frames); and updating a plurality of variables maintained for the plurality of rates based on the rates of the received test packets variables (column 8 lines 30-80, signal level at which the downlink frames are delivered to the mobile station can be varied) based on the parameter values included in the second data transmission (column 8 lines 30-80, While the G loop is active the mobile station compares the received bit sequence portions to the locally produced portions and measures e.g. the bit error ratio or frame erasure ratio and compiles

statistics of the measurement results in a desired manner. Since the received signal is examined in the G loop prior to channel decoding, the locally produced bit sequence at the mobile station also has to be channel encoded for the comparison to be meaningful. Complete statistics or information elements representing the reception error status in general are sent uplink to the test equipment. The test equipment receives the uplink frames sent by the mobile station and demodulates and decrypts them so that the statistical results in the received frame can be processed by the test equipment. The signal level at which the downlink frames are delivered to the mobile station can be varied so that the bit error ratio (BER) detected by it represents the sensitivity of the receiver of the mobile station especially at low signal levels. It is typical of type approval tests that a certain minimum sensitivity is required of the mobile station, which means that at a given signal level the bit error ratio must not exceed a predetermined limit value).

Numminen does not explicitly teach testing the reverse channel.

Schmutz in the same field of endeavor teaches (page 1 section 0011) in order to accurately test the conditions on the RF channel, the uplink and downlink transmission paths on the link must be tested.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify Numminen's system/method by incorporating the steps of testing the reverse channel as taught by Schmutz. The motivation is that (as suggested by Schmutz, page 1 section 0011) in order to accurately test the conditions on the RF channel, the uplink and downlink transmission paths on the link must be tested.

Numminen and Schmutz do not explicitly teach determining a packet error rate based on information included in the plurality of test packets.

Dejaco in the same field of endeavor teaches that the next test conducted by the present invention measures the frame error rate of the communication link. In the exemplary embodiment, when a frame erasure occurs, vocoder 14 re-transmits the last previous good frame. In the exemplary embodiment, signal generator 28 provides 10 ms. tones that are centered within the 20 ms. frames transmitted by the communication system. These tones are sent in a predetermined pattern and then that pattern is analyzed at monitor 26 to determine whether it is the same pattern as was sent by signal generator 28. The number of mismatches in the pattern equals the number of frame erasures on the combined forward and reverse links. In the present invention, when system characterization tests are being conducted, the signal received by transceiver 5 is provided to loop back element 15, and provided directly back to transceiver 5, which re-encodes, modulates and upconverts the signal and provides the signal to antenna 6 for broadcast (column 6 lines 3-6 and column 8 lines 33-45).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify Numminen and Schmutz's system/method by incorporating the teachings of the loop back packets being comprised of data for determining a packet error rate as suggested by Dejaco. The motivation is that (as suggested by column 2 lines 40-67) during system deployment, the quality of signal transmission at various distances from a base station may be determined on the basis of qualitative characterization of the received signal by subscriber unit users and various

system parameters (e.g., transmitted power level) may then be adjusted in order to improve communication quality; however, quantitative measurements of system performance would allow for accumulation of performance data more accurate than the subjective characterizations of received signal quality solicited from actual subscriber users.

In regards to claim 60 Numminen teaches for each received test packet, updating a first variable based on a sequence number of the test packet (column 8 lines 30-80 and column 8 lines 30-80)

6. Claims 6-8 and 10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Numminen in view of Anderson (US PAT PUB 2005/0003831) and Dejaco.

In regards to claim 6, Numminen teaches a method for testing one or more channels in a wireless data communication system, comprising: receiving a first data (column 6 lines 54-56, immediate assignment 503) transmission via a first channel (column 6 lines 54-56, the test equipment sends an immediate assignment 503 which may include various instructions for the mobile station); identifying parameter values descriptive of the first data transmission (column 6 lines 66-67 and column 7 lines 1-8, Particularly the immediate assignment 503 contains so-called rest octets in which the first two bits indicate the contents of the rest of the rest octet. By the priority date of this patent application values 11 and 10 of the values of the first two bits of the rest octet have been reserved but values 01 and 00 are unused. In accordance with a preferred embodiment of the invention at least one of these values can be reserved to

indicate that in response to the immediate assignment 503 the mobile station to be tested has to set itself in a special test mode); forming a second data transmission with the identified parameter values; and transmitting the second data transmission via a second channel (column 8 lines 37-40, Complete statistics or information elements representing the reception error status in general are sent uplink to the test equipment).

Numminen does not explicitly teach the parameter values comprise at least one of a) a serving sector from which the first data transmission was received, b) a sequence number of the first data transmission, and c) a length of the first data transmission.

Anderson in the same field of endeavor teaches the parameter values comprise length of first data length (page 39, Table 2-6).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify Numminen's system/method by incorporating the teaching of immediate assignment message having a message length as taught by Anderson. The motivation is that immediate assignment needs a parameter indicating the length of the message, so that, the system can easily and efficiently ascertain the total length of the data message it needs to decode.

Numminen and Anderson do not explicitly teach second data transmission comprises data for determining a packet error rate

Dejaco in the same field of endeavor teaches that the next test conducted by the present invention measures the frame error rate of the communication link. In the exemplary embodiment, when a frame erasure occurs, vocoder 14 re-transmits the last

previous good frame. In the exemplary embodiment, signal generator 28 provides 10 ms. tones that are centered within the 20 ms. frames transmitted by the communication system. These tones are sent in a predetermined pattern and then that pattern is analyzed at monitor 26 to determine whether it is the same pattern as was sent by signal generator 28. The number of mismatches in the pattern equals the number of frame erasures on the combined forward and reverse links. In the present invention, when system characterization tests are being conducted, the signal received by transceiver 5 is provided to loop back element 15, and provided directly back to transceiver 5, which re-encodes, modulates and upconverts the signal and provides the signal to antenna 6 for broadcast (column 6 lines 3-6 and column 8 lines 33-45).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify Numminen and Anderson's system/method by incorporating the teachings of the loop back packets being comprised of data for determining a packet error rate as suggested by Dejaco. The motivation is that (as suggested by column 2 lines 40-67) during system deployment, the quality of signal transmission at various distances from a base station may be determined on the basis of qualitative characterization of the received signal by subscriber unit users and various system parameters (e.g., transmitted power level) may then be adjusted in order to improve communication quality; however, quantitative measurements of system performance would allow for accumulation of performance data more accurate than the subjective characterizations of received signal quality solicited from actual subscriber users.

In regards to claims 7, 8 and 10, Numminen teaches the first channel is a forward traffic (downlink) channel and the second channel is a reverse traffic channel (uplink) (column 2 lines 25-31, test signal is received in the downlink direction, the test signal received is compared with a known form of the test signal, information produced by the comparison about errors detected in the received test signal is stored, and a signal representing the information stored is sent uplink); the first data transmission comprises a plurality of test packets (column 2 lines 25-31, test signal) and the second data transmission comprises a plurality of loop back packets (column 2 lines 25-31, a signal representing the information stored is sent uplink), and wherein the loop back packets include the parameter values descriptive of the test packets (column 8 lines 37-40, Complete statistics or information elements representing the reception error status in general are sent uplink to the test equipment).

7. Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over Numminen in view of Funk et al. (US PAT 6766164), hereinafter referred to as Funk and Dejaco.

In regards to claim 5, Numminen teaches a memory (column 7 line 27, memory media) communicatively coupled to a digital signal processing device (DSPD) (column 7 line 26, a microprocessor) capable of interpreting digital information to: receive a first message having included therein test settings for one or more channels (column 7 lines 18-20, test mode means that the mobile station to be tested is instructed to maintain a connection on a certain transmission channel) comprising traffic channels, auxiliary

channels, (column 11 lines 4-6, data, traffic and control channels) or a combination thereof (column 7 lines 46-47, at first the test equipment sends a comparison and statistical operation start command associated with the data channel); configure the one or more channels based on the test settings in the first message (column 7 lines 59-61, The mobile station closes, i.e. activates, the test loop); receive test packets via a forward traffic channel (column 8 lines 4-7, once the G loop has been activated the test equipment can start sending test data); transmit a plurality of loop back packets via a reverse traffic channel (column 8 lines 39-40, the test equipment receives the uplink frames sent by the mobile station), and transmit a plurality of loop back packets via a reverse traffic channel and transmitting signaling data via traffic or one or more auxiliary channels (column 11 lines 4-6, applicability of the invention to all mobile communication systems in which a mobile station can operate on data, traffic and control channels). Numminen teaches different modes (column 9 lines 14-15, G Loop and H Loop) of testing are supported, and the testing varies for each one or more channel; and receiving test packets via a forward traffic channel based on the supported mode of testing (column 8 lines 4-6, Once the G loop has been activated the test equipment can start sending test data, i.e. periods of a pseudorandom bit sequence packed in downlink frames).

Numminen does not explicitly teach one loop back packet is formed for each particular time interval.

Funk in the same field of endeavor teaches (Column 3 lines 61-67) test packets being formed for particular time interval.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify Numminen's method by incorporating one loop back packet being formed for each particular time interval as taught by Funk. The motivation is that generating and sending test packets at regular interval helps to diagnose a communication system very efficiently and effectively.

Numminen and Funk do not explicitly teach second data transmission comprises data for determining a packet error rate

Dejaco in the same field of endeavor teaches that the next test conducted by the present invention measures the frame error rate of the communication link. In the exemplary embodiment, when a frame erasure occurs, vocoder 14 re-transmits the last previous good frame. In the exemplary embodiment, signal generator 28 provides 10 ms. tones that are centered within the 20 ms. frames transmitted by the communication system. These tones are sent in a predetermined pattern and then that pattern is analyzed at monitor 26 to determine whether it is the same pattern as was sent by signal generator 28. The number of mismatches in the pattern equals the number of frame erasures on the combined forward and reverse links. In the present invention, when system characterization tests are being conducted, the signal received by transceiver 5 is provided to loop back element 15, and provided directly back to transceiver 5, which re-encodes, modulates and upconverts the signal and provides the signal to antenna 6 for broadcast (column 6 lines 3-6 and column 8 lines 33-45).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify Numminen and Funk's system/method by incorporating

the teachings of the loop back packets being comprised of data for determining a packet error rate as suggested by Dejaco. The motivation is that (as suggested by column 2 lines 40-67) during system deployment, the quality of signal transmission at various distances from a base station may be determined on the basis of qualitative characterization of the received signal by subscriber unit users and various system parameters (e.g., transmitted power level) may then be adjusted in order to improve communication quality; however, quantitative measurements of system performance would allow for accumulation of performance data more accurate than the subjective characterizations of received signal quality solicited from actual subscriber users.

8. Claim 9 is rejected under 35 U.S.C. 103(a) as being unpatentable over Numminen, Anderson and Dejaco as applied to claim 6 above and further in view of Funk.

In regards to claim 9, Numminen, Anderson and Dejaco teach sending loopback packet as described in the rejections of claim 6 above.

Numminen, Anderson and Dejaco do not explicitly teach one loop back packet is formed for each particular time interval.

Funk in the same field of endeavor teaches (Column 3 lines 61-67) test packets being formed for particular time interval.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify Numminen, Anderson and Dejaco's method by incorporating one loop back packet being formed for each particular time interval as

taught by Funk. The motivation is that generating and sending test packets at regular interval helps to diagnose a communication system very efficiently and effectively.

9. Claim 24 is rejected under 35 U.S.C. 103(a) as being unpatentable over Numminen, Anderson and Dejaco as applied to claim 6 above and further in view of Buchholz et al. (US PAT 5555266), hereinafter referred to as Buchholz.

In regards to claim 24, Numminen, Anderson and Dejaco teach loopback packets as described in the rejections of claim 6 above.

Numminen, Anderson and Dejaco do not explicitly teach each packet on the second data transmission includes a parameter value indicative of omission of one or more packets received on the first data transmission.

Buchholz in the same field of endeavor teaches in response to the receipt of a data packet (310) from a remote unit (112), the communications controller (110) identifies missing data within the data packet transmission, determines whether communication resources are available to support retransmission of the missing data, and if so, transmits a response to the requesting remote unit identifying the missing data.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify Numminen, Anderson and Dejaco's system by incorporating the method of notifying sender about missing data as taught by Buchholz. The motivation is that such method will accurately notify the sender about any problems

in the communication link, which results in loss of packets; thus making the network more reliable.

10. Claim 28 is rejected under 35 U.S.C. 103(a) as being unpatentable over Numminen in view of Buchholz et al. (US PAT 5555266), hereinafter referred to as Buchholz, Anderson and Dejaco.

In regards to claim 28, Numminen teaches a memory (column 7 line 27, memory media) communicatively coupled to a digital signal processing device (DSPD) (column 7 line 26, a microprocessor) capable of interpreting digital information to: receive a first data transmission via a first channel wherein first data transmission comprises a plurality of packets (column 7 lines 18-20, test mode means that the mobile station to be tested is instructed to maintain a connection on a certain transmission channel); identifying parameter values descriptive of the first data transmission (column 7 lines 46-47, at first the test equipment sends a comparison and statistical operation start command associated with the data channel); form a second data transmission with the identical parameter values (column 7 lines 59-61, The mobile station closes, i.e. activates, the test loop); transmit the second data transmission via a second channel (column 8 lines 39-40, the test equipment receives the uplink frames sent by the mobile station).

Numminen does not explicitly teach each packet on the second data transmission includes a parameter value indicative of omission of one or more packets received on the first data transmission.

Buchholz in the same field of endeavor teaches in response to the receipt of a data packet (310) from a remote unit (112), the communications controller (110) identifies missing data within the data packet transmission, determines whether communication resources are available to support retransmission of the missing data, and if so, transmits a response to the requesting remote unit identifying the missing data.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify Numminen's system by incorporating the method of notifying sender about missing data as taught by Buchholz. The motivation is that such method will accurately notify the sender about any problems in the communication link, which results in loss of packets; thus making the network more reliable.

Numminen and Buchholz do not explicitly teach the parameter values comprise at least one of a) a serving sector from which the first data transmission was received, b) a sequence number of the first data transmission, and c) a length of the first data transmission.

Anderson in the same field of endeavor teaches the parameter values comprise length of first data length (page 39, Table 2-6).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify Numminen and Buchholz's system/method by incorporating the teaching of immediate assignment message having a message length as taught by Anderson. The motivation is that immediate assignment needs a

parameter indicating the length of the message, so that, the system can easily and efficiently ascertain the total length of the data message it needs to decode.

Numminen, Buchholz and Anderson do not explicitly teach second data transmission comprises data for determining a packet error rate

Dejaco in the same field of endeavor teaches that the next test conducted by the present invention measures the frame error rate of the communication link. In the exemplary embodiment, when a frame erasure occurs, vocoder 14 re-transmits the last previous good frame. In the exemplary embodiment, signal generator 28 provides 10 ms. tones that are centered within the 20 ms. frames transmitted by the communication system. These tones are sent in a predetermined pattern and then that pattern is analyzed at monitor 26 to determine whether it is the same pattern as was sent by signal generator 28. The number of mismatches in the pattern equals the number of frame erasures on the combined forward and reverse links. In the present invention, when system characterization tests are being conducted, the signal received by transceiver 5 is provided to loop back element 15, and provided directly back to transceiver 5, which re-encodes, modulates and upconverts the signal and provides the signal to antenna 6 for broadcast (column 6 lines 3-6 and column 8 lines 33-45).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify Numminen, Buchholz and Anderson's system/method by incorporating the teachings of the loop back packets being comprised of data for determining a packet error rate as suggested by Dejaco. The motivation is that (as suggested by column 2 lines 40-67) during system deployment, the quality of signal

transmission at various distances from a base station may be determined on the basis of qualitative characterization of the received signal by subscriber unit users and various system parameters (e.g., transmitted power level) may then be adjusted in order to improve communication quality; however, quantitative measurements of system performance would allow for accumulation of performance data more accurate than the subjective characterizations of received signal quality solicited from actual subscriber users.

11. Claims 29, 31, 39, 61-63, 65, 67 and 68 are rejected under 35 U.S.C. 103(a) as being unpatentable over Numminen, in view of Kobayasi et al. (US PAT 6333932), hereinafter referred to as Kobayasi and Dejaco.

In regards to claims 29, 31, 39, 63, 67 and 68 Numminen teaches a method for testing one or more channels in a wireless data communication system, comprising: receiving a plurality of test packets via a forward traffic channel as described in the rejections of claim 1 above.

Numminen does not explicitly teach identifying a transmission source and a sequence number of each received test packet; forming a plurality of loop back packets for the plurality of received test packets, wherein each loop back packet covers zero or more test packets and includes the transmission source and the sequence number of each covered test packet; and transmitting the loop back packets. In regards to claim 62 and 65 Numminen does not explicitly teach a queue for the test packets.

Kobayasi in the same field of endeavor teaches, (column 2 lines 55-67) a test being started by issuing a test connectionless packet transmission request message (test start request) from the OS center 1 to SW station 3. The request message contains an identification information ID indicating terminal SW station 6. SW station 3 generates a test packet with the identification address of terminal SW station 6 set as its destination address DA and the identification address of its home station (SW station 3) set as its source address SA. The test packet is output to terminal SW station 6. In SW stations 4 and 5, test packets are processed as normal packets and transferred to terminal SW station 6. On receipt of the test packet, terminal SW station 6 outputs the packet with its DA and SA inverted. That is, the packet is returned from terminal SW station 6 to SW station 3, and it is reported to the OS center 1 upon re-arrival of the packet at the source SW station 3. Kobayasi further teaches the L2-PDU shown in FIG. 783 is an example of a BOM cell. The 2 bytes preceded by the header field stores a segment type ST, sequence number SN, and message identifier MID (or a multiplex identifier). The sequence number SN is a serial number assigned to a transferred cell for convenience in detecting the cell if it is lost or mistakenly inserted. Kobayasi teaches (column 97 lines 45-46) Loopback of a test cell is done in a 156 Mbps cell highway. In regards to claims 62 and 65 Kobayasi teaches buffers (fig 132) for data packets.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify Numminen's teaching by incorporating the loopback test scheme as taught by Kobayasi. The motivation is that (as suggested by Kobayasi column 317 lines 29-34) the present invention realizes an efficient test within a short

time by performing a test cell loopback check, which has been made in a test device, through a test program in the switch. Additionally, transmitting cell data from a test device requires no testing units because the loopback jig can replace the testing units. Further motivation (as suggested by Numminen, column 11 lines 5-8) is that the invention can also be modified in many ways without departing from the scope of the invention defined by the claims.

In regards to claims 29, 31, 39, 63, 67 and 68 Numminen and Kobayasi do not explicitly teach data transmission comprises data for determining a packet error rate

Dejaco in the same field of endeavor teaches that the next test conducted by the present invention measures the frame error rate of the communication link. In the exemplary embodiment, when a frame erasure occurs, vocoder 14 re-transmits the last previous good frame. In the exemplary embodiment, signal generator 28 provides 10 ms. tones that are centered within the 20 ms. frames transmitted by the communication system. These tones are sent in a predetermined pattern and then that pattern is analyzed at monitor 26 to determine whether it is the same pattern as was sent by signal generator 28. The number of mismatches in the pattern equals the number of frame erasures on the combined forward and reverse links. In the present invention, when system characterization tests are being conducted, the signal received by transceiver 5 is provided to loop back element 15, and provided directly back to transceiver 5, which re-encodes, modulates and upconverts the signal and provides the signal to antenna 6 for broadcast (column 6 lines 3-6 and column 8 lines 33-45).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify Numminen and Kobayasi's system/method by incorporating the teachings of the loop back packets being comprised of data for determining a packet error rate as suggested by Dejaco. The motivation is that (as suggested by column 2 lines 40-67) during system deployment, the quality of signal transmission at various distances from a base station may be determined on the basis of qualitative characterization of the received signal by subscriber unit users and various system parameters (e.g., transmitted power level) may then be adjusted in order to improve communication quality; however, quantitative measurements of system performance would allow for accumulation of performance data more accurate than the subjective characterizations of received signal quality solicited from actual subscriber users.

In regards to claim 31, Numminen teaches updating a plurality of variables based on the transmission source and sequence number of each packets included in the second data transmission (column 10 lines 46-49, the quality control station of a cellular radio network may collect statistical data sent by mobile stations and received by base stations from different parts of the cellular radio network).

In regards to claim 39 Numminen teaches a memory (column 7 line 27, memory media) communicatively coupled to a digital signal-processing device (DSPD) (column 7 line 26, a microprocessor).

In regards to claims 61 and 67 Numminen teaches a receive data processor (figure 3 element 304), a transmit data processor (figure 3 element 310) and a controller (figure 3 element 307).

12. Claims 45 and 49-56, are rejected under 35 U.S.C. 103(a) as being unpatentable over Numminen, in view of Kobayasi.

In regards to claim 45 and 56 Numminen teaches a method for testing one or more channels in a wireless data communication system, comprising: receiving a plurality of test packets via a forward traffic channel as described in the rejections of claim 1 above.

Numminen does not explicitly teach selecting rates for the test packets based on a rate selection scheme, and transmitting the test packets at the selected rates on the traffic channel.

Kobayasi in the same field of endeavor teaches, (column 2 lines 55-67) a test being started by issuing a test connectionless packet transmission request message (test start request) from the OS center 1 to SW station 3. The request message contains an identification information ID indicating terminal SW station 6. SW station 3 generates a test packet with the identification address of terminal SW station 6 set as its destination address DA and the identification address of its home station (SW station 3) set as its source address SA. The test packet is output to terminal SW station 6. In SW stations 4 and 5, test packets are processed as normal packets and transferred to terminal SW station 6. On receipt of the test packet, terminal SW station 6 outputs the

packet with its DA and SA inverted. That is, the packet is returned from terminal SW station 6 to SW station 3, and it is reported to the OS center 1 upon re-arrival of the packet at the source SW station 3. Kobayasi further teaches the L2-PDU shown in FIG. 783 is an example of a BOM cell. The 2 bytes preceded by the header field stores a segment type ST, sequence number SN, and message identifier MID (or a multiplex identifier). The sequence number SN is a serial number assigned to a transferred cell for convenience in detecting the cell if it is lost or mistakenly inserted. Kobayasi teaches (column 97 lines 45-46) Loopback of a test cell is done in a 156 Mbps cell highway. Kobayasi discloses protocol type, packet type, number of records field, time interval, source address, sequence number in the packets shown in FIGS. 582 through 628. Kobayasi teaches (column 3 lines 5-10) that since the source SW station 3 and the terminal SW station 6 mark the time stamp onto the payload field of the packet, the OS center 1 is informed of the transmission time of packets according to the information. Kobayasi teaches buffers (fig 132) for data packets.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify Numminen's teaching by incorporating the loopback test scheme as taught by Kobayasi. The motivation is that (as suggested by Kobayasi column 317 lines 29-34) the present invention realizes an efficient test within a short time by performing a test cell loopback check, which has been made in a test device, through a test program in the switch. Additionally, transmitting cell data from a test device requires no testing units because the loopback jig can replace the testing units. Further motivation (as suggested by Numminen, column 11 lines 5-8) is that the

invention can also be modified in many ways without departing from the scope of the invention defined by the claims.

In regards to claims 50-52, 54 and 55 Numminen does not explicitly teach of having protocol type, packet type, number of records field, time interval, source address, sequence number in the test packet. In regards to claim 58 Numminen does not explicitly teach a queue for the test packets.

In regards to claims 50, 51, 54 and 55 Kobayasi discloses protocol type, packet type, number of records field, time interval, source address, sequence number in the packets shown in FIGS. 582 through 628. In regards to claim 52 Kobayasi teaches (column 3 lines 5-10) that since the source SW station 3 and the terminal SW station 6 mark the time stamp onto the payload field of the packet, the OS center 1 is informed of the transmission time of packets according to the information. In regards to claim 58, 62 and 65 Kobayasi teaches buffers (fig 132) for data packets.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify Numminen's teaching by incorporating the loopback test scheme as taught by Kobayasi. The motivation is that (as suggested by Kobayasi column 317 lines 29-34) the present invention realizes an efficient test within a short time by performing a test cell loopback check, which has been made in a test device, through a test program in the switch. Additionally, transmitting cell data from a test device requires no testing units because the loopback jig can replace the testing units. Further motivation (as suggested by Numminen, column 11 lines 5-8) is that the

invention can also be modified in many ways without departing from the scope of the invention defined by the claims.

In regards to claim 53, Numminen does not explicitly teach field indicative of whether any loop back packets were lost due to buffer overflow.

Kobayasi in the same field of endeavor teaches, (column 2 lines 55-67) a test being started by issuing a test connectionless packet transmission request message (test start request) from the OS center 1 to SW station 3. The request message contains an identification information ID indicating terminal SW station 6. SW station 3 generates a test packet with the identification address of terminal SW station 6 set as its destination address DA and the identification address of its home station (SW station 3) set as its source address SA. The test packet is output to terminal SW station 6. In SW stations 4 and 5, test packets are processed as normal packets and transferred to terminal SW station 6. On receipt of the test packet, terminal SW station 6 outputs the packet with its DA and SA inverted. That is, the packet is returned from terminal SW station 6 to SW station 3, and it is reported to the OS center 1 upon re-arrival of the packet at the source SW station 3. Kobayasi further teaches the L2-PDU shown in FIG. 783 is an example of a BOM cell. The 2 bytes preceded by the header field stores a segment type ST, sequence number SN, and message identifier MID (or a multiplex identifier). The sequence number SN is a serial number assigned to a transferred cell for convenience in detecting the cell if it is lost or mistakenly inserted.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify Numminen's system/method by incorporating the steps of

having source id and sequence number in test packets as taught by Kobayasi. The motivation is that having a source and sequence number enables a system to easily and efficiently identify the source of the test packets and number of packets received or lost due to overflow for statistical record keeping.

In regards to claim 56 Numminen teaches a memory (column 7 line 27, memory media) communicatively coupled to a digital signal-processing device (DSPD) (column 7 line 26, a microprocessor).

In regards to claim 49 Numminen teaches the first message includes an indication of maintenance of a test mode on the traffic channel in event of a connection closure or a lost connection (column 7 lines 18-20, So test mode means that the mobile station to be tested is instructed to maintain a connection on a certain transmission channel. The mobile station is kept in the test mode by Layer 3 signaling).

13. Claims 46-48 are rejected under 35 U.S.C. 103(a) as being unpatentable over Numminen and Kobayasi as applied to claim 45 above, and further in view of Ikeda (US PAT 5636212).

In regards to claims 46 and 47 Numminen and Kobayasi teach a method for testing one or more channels in a wireless data communication system as described in the rejections of claim 45 above.

Numminen and Kobayasi do not explicitly teach message having maximum and minimum rate for rate selection.

Ikeda in the same field of endeavor teaches (column 8 lines 38-39) reservation request being issued with a maximum band-width and a minimum band-width.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify Numminen and Kobayasi's system/method by incorporating the concept of sending maximum band-width and a minimum band-width via message as taught by Ikeda. The motivation is that (as suggested by Ikeda, column 2 lines 5-10) to provide a flexible method of reserving a band-width for a burst capable of flexibly reserving a band-width according to a maximum band-width and a minimum band-width requested for reservation.

In regards to claim 48, Numminen and Kobayasi do not explicitly teach with the steps of the selected rates for the test packets being further limited by a maximum rate specified by a media access control (MAC) protocol

It would have been obvious of one of ordinary skill in the art at the time of invention to modify Numminen and Kobayasi's system/method with the steps of the selected rates for the test packets being further limited by a maximum rate specified by a media access control (MAC) protocol; as a link defined to have a maximum bandwidth rate cannot operate in a higher bandwidth which may cause overflow of data in buffers and in result cause loss of packets.

14. Claims 57 and 58 are rejected under 35 U.S.C. 103(a) as being unpatentable over Numminen, in view of Kobayasi et al. (US PAT 6333932), hereinafter referred to as Kobayasi and Ikeda (US PAT 5636212).

In regards to claims 57 and 58 Numminen teaches a method for testing one or more channels in a wireless data communication system, comprising: receiving a plurality of test packets via a forward traffic channel as described in the rejections of claim 1 above.

Numminen does not explicitly teach identifying a transmission source and a sequence number of each received test packet; forming a plurality of loop back packets for the plurality of received test packets, wherein each loop back packet covers zero or more test packets and includes the transmission source and the sequence number of each covered test packet; and transmitting the loop back packets. Numminen does not explicitly teach selecting rates for the test packets based on a rate selection scheme, and transmitting the test packets at the selected rates on the traffic channel. In regards to claim 58 Numminen does not explicitly teach a queue for the test packets.

Kobayasi in the same field of endeavor teaches, (column 2 lines 55-67) a test being started by issuing a test connectionless packet transmission request message (test start request) from the OS center 1 to SW station 3. The request message contains an identification information ID indicating terminal SW station 6. SW station 3 generates a test packet with the identification address of terminal SW station 6 set as its destination address DA and the identification address of its home station (SW station 3) set as its source address SA. The test packet is output to terminal SW station 6. In SW stations 4 and 5, test packets are processed as normal packets and transferred to terminal SW station 6. On receipt of the test packet, terminal SW station 6 outputs the packet with its DA and SA inverted. That is, the packet is returned from terminal SW

station 6 to SW station 3, and it is reported to the OS center 1 upon re-arrival of the packet at the source SW station 3. Kobayasi further teaches the L2-PDU shown in FIG. 783 is an example of a BOM cell. The 2 bytes preceded by the header field stores a segment type ST, sequence number SN, and message identifier MID (or a multiplex identifier). The sequence number SN is a serial number assigned to a transferred cell for convenience in detecting the cell if it is lost or mistakenly inserted. Kobayasi teaches (column 97 lines 45-46) Loopback of a test cell is done in a 156 Mbps cell highway. Kobayasi discloses protocol type, packet type, number of records field, time interval, source address, sequence number in the packets shown in FIGS. 582 through 628. Kobayasi teaches (column 3 lines 5-10) that since the source SW station 3 and the terminal SW station 6 mark the time stamp onto the payload field of the packet, the OS center 1 is informed of the transmission time of packets according to the information.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify Numminen's teaching by incorporating the loopback test scheme as taught by Kobayasi. The motivation is that (as suggested by Kobayasi column 317 lines 29-34) the present invention realizes an efficient test within a short time by performing a test cell loopback check, which has been made in a test device, through a test program in the switch. Additionally, transmitting cell data from a test device requires no testing units because the loopback can replace the testing units. Further motivation (as suggested by Numminen, column 11 lines 5-8) is that the invention can also be modified in many ways without departing from the scope of the invention defined by the claims.

In regards to claim 57 Numminen and Kobayasi do not explicitly teach message having maximum and minimum rate for rate selection.

Ikeda in the same field of endeavor teaches (column 8 lines 38-39) reservation request being issued with a maximum band-width and a minimum band-width.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify Numminen and Kobayasi's system/method by incorporating the concept of sending maximum band-width and a minimum band-width via message as taught by Ikeda. The motivation is that (as suggested by Ikeda, column 2 lines 5-10) to provide a flexible method of reserving a band-width for a burst capable of flexibly reserving a band-width according to a maximum band-width and a minimum band-width requested for reservation.

In regards to claim 57, Numminen, Kobayasi and Ikeda do not explicitly teach testing the reverse channel.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify Numminen and Kobayasi's system/method by incorporating the steps of testing the reverse channel. The motivation is that in order to accurately test the conditions on the RF channel, the uplink and downlink transmission paths on the link must be tested.

In regards to claim 57, Numminen, Kobayasi and Ikeda do not explicitly teach in accordance with the rate selection scheme the selected rates are varied in accordance with a set of rules.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify Numminen and Kobayasi's system/method by incorporating the steps of selected rates being varied in accordance with a set of rules, as system supporting multiple rates, need to perform testing on all rates to efficiently test the link for reliable communication.

15. Claims 11-13, 15-20, 22, 23, 25-27 are rejected under 35 U.S.C. 103(a) as being unpatentable over Numminen, Anderson and Dejaco as applied to claim 6 above and further in view of Kobayasi and Ikeda.

In regards to claims 11, 12, 13, 15-20, 22, 23, 25, 26 and 27 Numminen, Anderson and Dejaco teach a method for testing one or more channels in a wireless data communication system, comprising: receiving a plurality of test packets via a forward traffic channel as described in the rejections of claim 6 above.

Numminen, Anderson and Dejaco do not explicitly teach of having protocol type, packet type, number of records field, time interval, source address, sequence number in the test packet.

Kobayasi in the same field of endeavor teaches protocol type, packet type, number of records field, time interval, source address, sequence number in the packets shown in FIGS. 582 through 628. In regards to claims 13 and 20 Kobayasi teaches (column 3 lines 5-10) that since the source SW station 3 and the terminal SW station 6 mark the time stamp onto the payload field of the packet, the OS center 1 is informed of the transmission time of packets according to the information.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify Numminen, Anderson and Dejaco's system/method by incorporating the loopback test scheme as taught by Kobayasi. The motivation is that (as suggested by Kobayasi column 317 lines 29-34) the present invention realizes an efficient test within a short time by performing a test cell loopback check, which has been made in a test device, through a test program in the switch. Additionally, transmitting cell data from a test device requires no testing units because the loopback jig can replace the testing units. Further motivation (as suggested by Numminen, column 11 lines 5-8) is that the invention can also be modified in many ways without departing from the scope of the invention defined by the claims.

16. Claims 40-44 are rejected under 35 U.S.C. 103(a) as being unpatentable over Numminen in view of Oommen et al. (US PAT 6799203) and Dejaco.

In regards to claims 40-44 Numminen teaches a method for testing one or more channels in a wireless data communication system, comprising: receiving a plurality of test packets via a forward traffic channel as described in the rejections of claim 1 above. In regards to claims 40, 41, 42 and 43 Numminen teaches a method of collecting data for a first parameter while in idle state (column 7 lines 46-59, at first the test equipment sends a comparison and statistical operation start command associated with the data channel, which command can be called CLOSE_Multi-slot_loop_CMD. The close command may include an identifier on the basis of which the mobile station identifies the G loop. The mobile station acknowledges the message using an acknowledge

message which can be called CLOSE_Multi-slot_loop_ACK. The mobile station closes, i.e. activates, the test loop in a certain time after it has sent the acknowledge. . Numminen teaches collecting a second statistic for a second parameter while in connected state (column 8 lines 4-6, once the G loop has been activated the test equipment can start sending test data, i.e. periods of a pseudorandom bit sequence packed in downlink frames). Numminen teaches receiving a first message requesting the first or second statistic, and sending a second message with the requested first or second statistic (column 8 lines 29-39, while the G loop is active the mobile station compares the received bit sequence portions to the locally produced portions and measures e.g. the bit error ratio or frame erasure ratio and compiles statistics of the measurement results in a desired manner. Complete statistics or information elements representing the reception error status in general are sent uplink to the test equipment).

In regards to claims 40-43 Numminen does not explicitly teach, collecting statistics during each of the transactions.

Oommen in the same field of endeavor teaches (column 2 lines 46-49) OTAMD involves requesting statistics and performing diagnostic tests in the MS using a command issued from the network for testing purpose.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify Numminen's teaching by incorporating the statistic gathering during transactions as taught by Oommen. The motivation is that (as taught by Oommen, column 1 lines 14-15) a fast and efficient method for activating and

managing a MS over the air would be beneficial both for the user and the wireless service provider.

In regards to claims 40 and 44 Numminen and Oommen do not explicitly teach statistics are related to packet error rate.

Dejaco in the same field of endeavor teaches that the next test conducted by the present invention measures the frame error rate of the communication link. In the exemplary embodiment, when a frame erasure occurs, vocoder 14 re-transmits the last previous good frame. In the exemplary embodiment, signal generator 28 provides 10 ms. tones that are centered within the 20 ms. frames transmitted by the communication system. These tones are sent in a predetermined pattern and then that pattern is analyzed at monitor 26 to determine whether it is the same pattern as was sent by signal generator 28. The number of mismatches in the pattern equals the number of frame erasures on the combined forward and reverse links. In the present invention, when system characterization tests are being conducted, the signal received by transceiver 5 is provided to loop back element 15, and provided directly back to transceiver 5, which re-encodes, modulates and upconverts the signal and provides the signal to antenna 6 for broadcast (column 6 lines 3-6 and column 8 lines 33-45).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify Numminen and Oommen's system/method by incorporating the teachings of determining statistics related to packet error rate as suggested by Dejaco. The motivation is that (as suggested by column 2 lines 40-67) during system deployment, the quality of signal transmission at various distances from a

base station may be determined on the basis of qualitative characterization of the received signal by subscriber unit users and various system parameters (e.g., transmitted power level) may then be adjusted in order to improve communication quality; however, quantitative measurements of system performance would allow for accumulation of performance data more accurate than the subjective characterizations of received signal quality solicited from actual subscriber users.

In regards to claim 44, Numminen teaches a memory (column 7 line 27, memory media) communicatively coupled to a digital signal processing device (DSPD) (column 7 line 26, a microprocessor).

17. Claims 64 and 66 are rejected under 35 U.S.C. 103(a) as being unpatentable over Numminen, Kobayasi and ikeda.

In regards to claims 64 and 66 Numminen teaches a method/means for testing one or more channels in a wireless data communication system, comprising: receiving a plurality of test packets via a forward traffic channel as described in the rejections of claim 1 above. In regards to claim 66 Numminen teaches a method of collecting data for a first parameter while in idle state (column 7 lines 46-59, at first the test equipment sends a comparison and statistical operation start command associated with the data channel, which command can be called CLOSE_Multi-slot_loop_CMD. The close command may include an identifier on the basis of which the mobile station identifies the G loop. The mobile station acknowledges the message using an acknowledge message which can be called CLOSE_Multi-slot_loop_ACK. The mobile station closes,

i.e. activates, the test loop in a certain time after it has sent the acknowledge. . Numminen teaches collecting a second statistic for a second parameter while in connected state (column 8 lines 4-6, once the G loop has been activated the test equipment can start sending test data, i.e. periods of a pseudorandom bit sequence packed in downlink frames). Numminen teaches receiving a first message requesting the first or second statistic, and sending a second message with the requested first or second statistic (column 8 lines 29-39, while the G loop is active the mobile station compares the received bit sequence portions to the locally produced portions and measures e.g. the bit error ratio or frame erasure ratio and compiles statistics of the measurement results in a desired manner. Complete statistics or information elements representing the reception error status in general are sent uplink to the test equipment).

Numminen does not explicitly teach test packets having transmission source and a sequence number.

Kobayasi in the same field of endeavor teaches, (column 2 lines 55-67) a test being started by issuing a test connectionless packet transmission request message (test start request) from the OS center 1 to SW station 3. The request message contains an identification information ID indicating terminal SW station 6. SW station 3 generates a test packet with the identification address of terminal SW station 6 set as its destination address DA and the identification address of its home station (SW station 3) set as its source address SA. The test packet is output to terminal SW station 6. In SW stations 4 and 5, test packets are processed as normal packets and transferred to terminal SW station 6. On receipt of the test packet, terminal SW station 6 outputs the

packet with its DA and SA inverted. That is, the packet is returned from terminal SW station 6 to SW station 3, and it is reported to the OS center 1 upon re-arrival of the packet at the source SW station 3. Kobayasi further teaches the L2-PDU shown in FIG. 783 is an example of a BOM cell. The 2 bytes preceded by the header field stores a segment type ST, sequence number SN, and message identifier MID (or a multiplex identifier). The sequence number SN is a serial number assigned to a transferred cell for convenience in detecting the cell if it is lost or mistakenly inserted.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify Numminen's system/method by incorporating the steps of having source id and sequence number in test packets as taught by Kobayasi. The motivation is that having a source and sequence number enables a system to easily and efficiently identify the source of the test packets and number of packets received for statistical record keeping.

Numminen and Kobayasi does not explicitly teach message having maximum and minimum rate for rate selection

Ikeda in the same field of endeavor teaches (column 8 lines 38-39) reservation request being issued with a maximum band-width and a minimum band-width.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify Numminen and Kobayasi's system/method by incorporating the concept of sending maximum band-width and a minimum band-width via message as taught by Ikeda. The motivation is that (as suggested by Ikeda, column 2 lines 5-10) to provide a flexible method of reserving a band-width for a burst capable

of flexibly reserving a band-width according to a maximum band-width and a minimum band-width requested for reservation.

In regards to claim 64 and 66 Numminen, Kobayasi and ikeda do not explicitly teach in accordance with the rate selection scheme the selected rates are varied in accordance with a set of rules.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify Numminen and Kobayasi's system/method by incorporating the steps of selected rates being varied in accordance with a set of rules, as system supporting multiple rates, need to perform testing on all rates to efficiently test the link for reliable communication.

In regards to claim 64 Numminen teaches a receive data processor (figure 3 element 304), a transmit data processor (figure 3 element 310) and a controller (figure 3 element 307).

18. Claims 14 and 21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Numminen, Anderson and Dejaco as applied to claim 6 above and further in view of Kobayasi.

Numminen, Anderson and Dejaco teach a method for testing one or more channels in a wireless data communication system, comprising: receiving a plurality of test packets via a forward traffic channel as described in the rejections of claim 6 above.

Numminen, Anderson and Dejaco do not explicitly teach field indicative of whether any loop back packets were lost due to buffer overflow and a field indicative of

a number of MAC packets received in a Physical Layer packet containing the test packet covered by the record.

Kobayasi in the same field of endeavor teaches, (column 2 lines 55-67) a test being started by issuing a test connectionless packet transmission request message (test start request) from the OS center 1 to SW station 3. The request message contains an identification information ID indicating terminal SW station 6. SW station 3 generates a test packet with the identification address of terminal SW station 6 set as its destination address DA and the identification address of its home station (SW station 3) set as its source address SA. The test packet is output to terminal SW station 6. In SW stations 4 and 5, test packets are processed as normal packets and transferred to terminal SW station 6. On receipt of the test packet, terminal SW station 6 outputs the packet with its DA and SA inverted. That is, the packet is returned from terminal SW station 6 to SW station 3, and it is reported to the OS center 1 upon re-arrival of the packet at the source SW station 3. Kobayasi further teaches the L2-PDU shown in FIG. 783 is an example of a BOM cell. The 2 bytes preceded by the header field stores a segment type ST, sequence number SN, and message identifier MID (or a multiplex identifier). The sequence number SN is a serial number assigned to a transferred cell for convenience in detecting the cell if it is lost or mistakenly inserted.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify Numminen, Anderson and Dejaco's system/method by incorporating the steps of having source id and sequence number in test packets as taught by Kobayasi. The motivation is that having a source and sequence number

enables a system to easily and efficiently identify the source of the test packets and number of packets received or lost due to overflow for statistical record keeping.

Response to Arguments

19. Applicant's arguments see pages 16-34 of the Remarks section, filed 3/15/2007, with respect to the rejections of the claims have been fully considered. Applicant has amended independent claims 1, 5, 6, 28-32, 39, 40, 44, 45, 56, 57, 59, 61, 63, 64 and 66-68. Applicant's amendment necessitated a new ground of rejections presented in this office action. As such, any response to Applicant's argument is moot.

Conclusion

20. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Salman Ahmed whose telephone number is (571) 272-8307. The examiner can normally be reached on 8:00 am - 4:30 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Hassan Kizou can be reached on (571) 272-3088. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

SA
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Patent Examiner
5/22/2007

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